

SPACE TECHNOLOGY & APPLICATIONS INTERNATIONAL FORUM (STAIF-2001)

MARSHALL SPACE
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HUNTSVILLE, AL

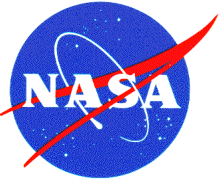
Mechanism to Ensure Safety of Fission System During Launch

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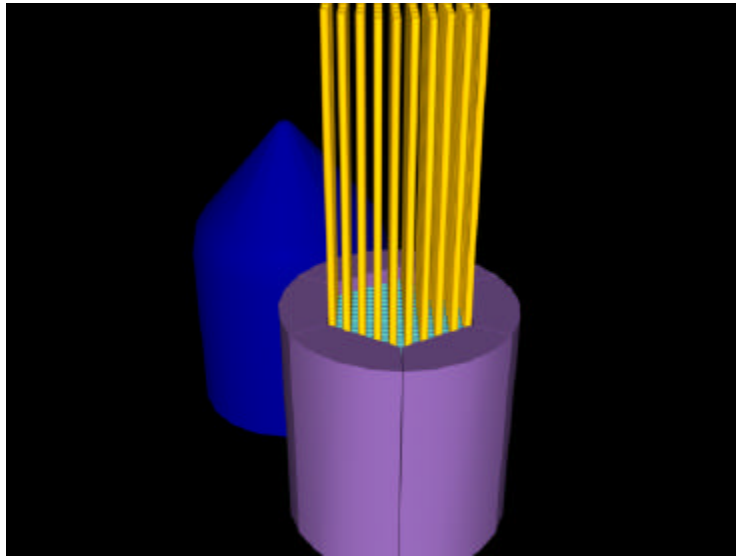
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In-Space Fueling



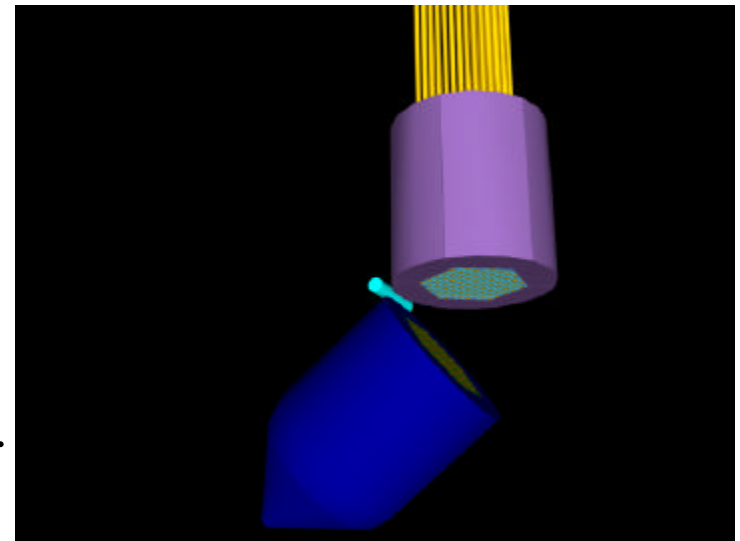
In-space fueling option for SAFE-100

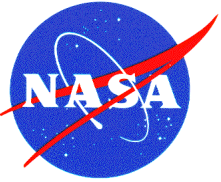
Concept Description

- Fuel launched in canister external to reactor.
- When desired orbit is achieved, canister pivots into place and inserts fuel.
- Canister is then jettisoned (if desired).
- Builds on concept originally proposed by NEPSTP program.

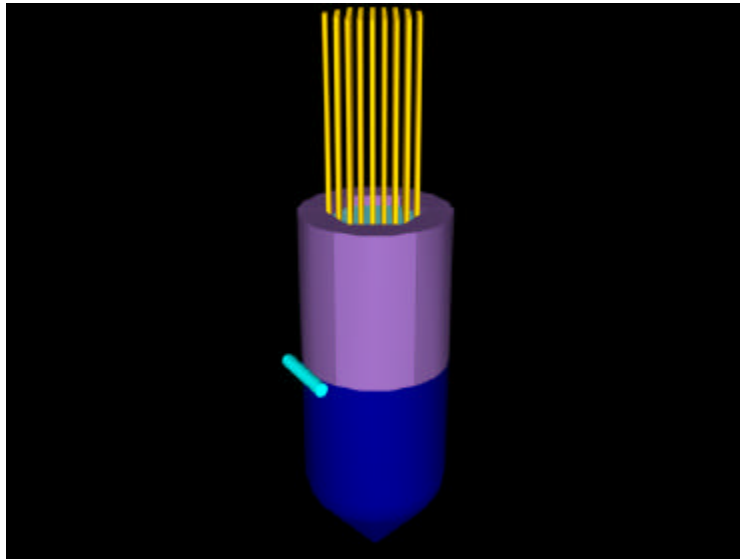
Potential Benefits

- Canister can be designed for extremely large shutdown margins during both credible and non-credible accidents.
- Re-entry cone on fueling canister potentially simpler / lighter than re-entry cone on reactor.
- Jettisoning canister after fueling increases specific power during NEP phase.





In-Space Fueling



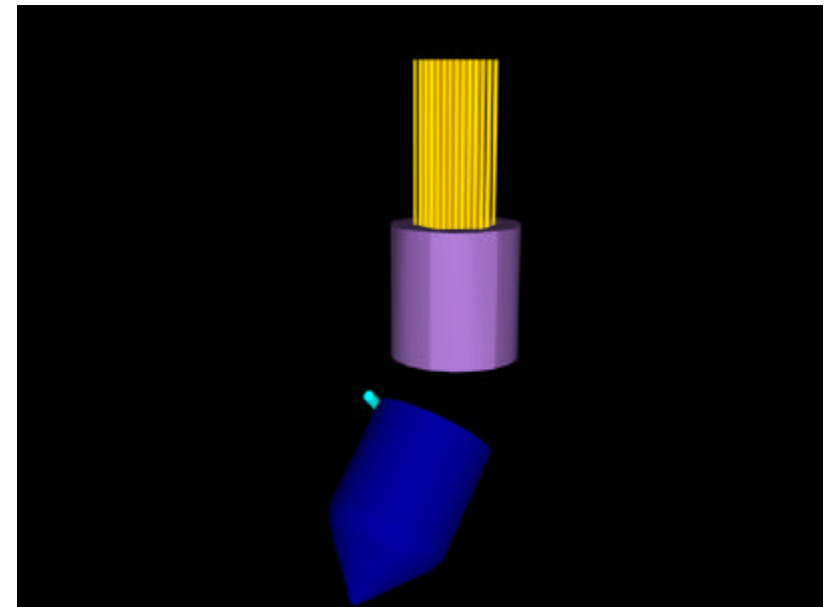
Fuel insertion into SAFE-100

Potential Concerns

- **Reliability** - reactor cannot operate unless nearly all fuel successfully inserted.
- **Precedent** - optimal method for ensuring launch safety is mission/concept dependent.

Status

- Canister / fueling mechanism designed.
- Fabrication slated to begin May 2001.
- Initial testing late FY01.



After fueling, canister is jettisoned